IPC-1752A

Materials Declaration Management

IPC 175X Schema Version 2.0

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A standard developed by IPC

Association Connecting Electronics Industries



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Materials Declaration Management

Developed by the Materials Declaration Task Group (2-18b) of the Supplier Declaration Subcommittee (2-18) of IPC

Users of this publication are encouraged to participate in the development of future revisions.

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Foreword

While IPC-1751 defines the generic requirements for declaration process management, IPC-1752 establishes a standard reporting format for material declaration data exchange between supply chain participants and supports reporting of bulk materials, components, printed circuit boards (PCBs), sub-assemblies, and products. This standard defines the content and requirements for four distinct classes of declarations that can be used between members of a supply chain relationship.

1752 - Class A: Declaration Query/Reply
1752 - Class B: Material Group Declaration
1752 - Class C: Material Composition Summary Declaration - Product Level
1752 - Class D: Material Composition Declaration - Homogeneous Material Level, with JIG-101 (latest revision) list

The initial focus of material reporting is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003, on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS). In April, 2005 the Electronic Industries Alliance, Japan Green Procurement Survey Standardization Initiative and the Joint Electronic Device Engineering Council (JEDEC) published the Joint Industry Guide Material Composition Declaration for Electronic Products (JIG-101), which established the materials and substances to be disclosed by suppliers when those materials and substances are present in products and subproducts that are incorporated into electrical and electronic equipment. The IPC-1752 standard supports the substance disclosure requirements outlined by the latest version of JIG-101 and accommodates disclosure of additional substance information.

There are several appendices to the 1752 which represent various lists taken from legal directives and other standard bodies. These lists are subject to change; therefore, corresponding appendices in this standard will be amended to reflect those changes at regular intervals. In addition, some substances/materials may exist on more than one list, and since a requester may require meeting more than one material reporting convention described in the appendices, users should be aware that duplicate reporting of a single substance in a material could result from adhering to the reporting conventions of more than one appendix. Tool designers for 1752 implementation are cautioned to consider screening to remove duplication prior to summing the mass or calculating mass percentages.

This standard will be updated to reflect changes affecting the global market. The methodology for update is described in the section on standard maintenance.

Version 1.1 of this standard was supported by two Portable Document Format (PDF) forms (1752-1 and 1752-2) and the Users Guide (1752-3). However, starting with version 2.0, this standard will not be supported directly with a PDF form. Third party software developers are invited to supply the implementation tool, and one organization has already made a free download implementation tool available. In version 2.0 the data exchange format is specified as Extensible Markup Language (XML).

Using a software tool of the user's choice, relevant data can be saved locally and submitted electronically back to the requester. The data structure is based on an underlying Unified Modeling Language (UML) model, which in turn is represented by an XML schema which is used to validate the XML data files. The schema and model are included in Figure 4-1 and Appendix E.

End product producers and customers throughout the supply chain are requesting that suppliers provide material declarations so that the recipient is aware of the presence and amount of certain chemicals in the products it procures. This standard defines the creation of a document or electronic record that will serve as a standard way for reporting and collecting this type of data.

Acknowledgment

Any document involving a complex technology draws material from a vast number of sources. While the principal members of the Materials Declaration Task Group (2-18b) of the Supplier Declaration Subcommittee (2-18) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of the IPC extend their gratitude.

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Materials Declaration Management

1 SCOPE

This standard establishes the requirements for exchanging material and substance data between suppliers and their customers for electrical and electronic product. This standard applies to products, components, subproducts and materials that are supplied to producers of electrical and electronic products for incorporation into their products. It covers materials and substances that may be present in the supplied product or subproduct. It does not apply to process chemicals, unless those process chemicals constitute part of the finished product or subproduct.

This standard applies to business-to-business transactions. It is not intended to be used by the general public when making purchasing decisions. The standard is not a compliance guide. As revisions to the European Union's Restriction of Hazardous Substances (RoHS) Directive are released, this standard will be updated. Exemptions are for specific applications as defined, and management of usage and expirations are between the requester and the supplier.

1.1 Purpose

This standard is intended to benefit suppliers and their customers by providing consistency and efficiency to the material declaration process. It establishes standard electronic data exchange formats that will facilitate and improve data transfer along the entire global supply chain.

1.2 Classes

This standard establishes four classes for declaration of materials. Classes may be combined as desired.

Table 1-1 Material Declaration Classification

Class	Description	Declaration Type	Detailed Requirements
A	– Reporting in Query/Reply format	Query/Reply	– Supplier provides responses to standard queries and/or optional custom queries as shown in Figure 6-1.
B	– Material group reporting	Material Group	– Supplier states the amount of different groupings of materials within a product.
C	– JIG-101 substance category reporting for the product – Additional substance categories reporting at the product level	Substance summary groups	– Supplier provides mass and/or concentration of JIG-101 substance category at the product level if above thresholds. – Additional substance categories can be added and reported at the product level.
D	– Substances reporting at the homogeneous material level – JIG-101 substances and additional substances are accommodated	Full substances	– Supplier provides location, mass, substances at homogeneous material level.

2 APPLICABLE DOCUMENTS

The following documents form a part of this standard to the extent specified herein. The revision of the document in effect at the time of solicitation **shall** take precedence.

The requirements of the generic standard, IPC-1751, are a ***mandatory*** part of this standard.

2.1 IPC[1]

IPC T-50 *Terms and Definitions*

Version 2.0:

IPC-1751 *Generic Requirements for Declaration Process Management*

IPC-1752 *Materials Declaration Management*

See Appendix G for previous versions of IPC-175X.

2.2 European Union (EU) Restrictions on Hazardous Substances (RoHS) Directive[2]

Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

2.3 International Electrotechnical Commission (IEC) Standards[3]

IEC 60194 *Printed Board Design, Manufacture and Assembly – Terms and Definitions*

IEC 62474 *Material Declaration for Electrical and Electronic Equipment* (under consideration)

2.4 Joint Industry Guide-101 (JIG-101)[4]

Material Composition Declaration for Electronic Products JIG-101 2.0 or its most current version is a product of Electronics Industries Alliance (EIA), Joint Electronic Device Engineering Council (JEDEC), and the Japanese Green Procurement Survey Standardization Initiative (JGPSSI). The current JIG is available for download at www.eia.org/jig.

2.5 REACH (Registration, Evaluation and Authorization of Chemicals)

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC, and 2000/21/EC.

Available at http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm

2.6 RosettaNet[5]

RosettaNet- Partner Interface Processes (PIP)

2A13 *Distribute Material Composition Information*

2A15 *Request Material Composition Information*

[1] www.ipc.org
[2] europa.eu
[3] www.iec.ch
[4] www.eia.org/jig
[5] www.rosettanet.org

3 REQUIREMENTS

The following requirements are applicable to all the IPC-1752 material declaration processes. In addition, the requirements of IPC-1751 are a ***mandatory*** part of this standard.

3.1 Terms and Definitions

All terms are in accordance with IPC-T-50 or IEC 60194 and have been listed below to assist in interpretation of this standard. Additional terms defined by this standard are included below.

3.1.1 homogeneous material

A material that cannot be mechanically disjointed into different materials. The term "homogeneous" means "of uniform composition throughout." Examples of "homogeneous materials" are individual types of plastics, ceramics, glass, metals, alloys, paper, board, resins and coatings. The term "mechanically disjointed" means that the materials can, in principle, be separated by mechanical actions such as: unscrewing, cutting, crushing, grinding and abrasive processes.

3.1.2 intentionally added

Deliberate use in the formulation of a product where continued presence is desired to provide a specific characteristic, appearance or quality.

3.1.3 material

Matter that is made up of one or more substances.

3.1.4 mechanically disjointed

Separated by mechanical actions such as unscrewing, cutting, crushing, grinding, and abrasive processes.

3.1.5 product

Any substance, material, sub-part, part, sub-assembly, or assembly up to a completed original manufacturer's assembly that is the subject of a declaration.

3.1.6 requester

The party initiating the 175x communication when using the request/response communication mode. The requester is the recipient of the supplier's response.

3.1.7 subproduct

A sub-unit of a product.

3.1.8 substances

Chemical elements and their compounds.

3.1.9 supplier

The organization or company responsible for providing the goods and/or services required to produce an electrical or electronic product.

3.1.10 threshold level

The level of concentration which defines the value from which the presence of a substance in a product **shall** be reported; often referred to as the Maximum Concentration Value (MCV). Depending upon the regulation, a threshold is most commonly defined either as 'above' or 'equal to or above'.

Note: Numerical threshold levels are provided in mass %. For calculating parts per million (ppm), the conversion from mass % to ppm is 0.1 % = 1000 ppm.

4 DATA MODEL

A data model is a simplified representation of a system that ignores extraneous details in order to concentrate on some particular aspect of the system. Models are useful tools for understanding and explaining the operation of any system. An information model is an abstract view of a system that specifies and describes the information used by the system. The most useful information models describe constraints on information, and relationships between information, in addition to the structure of the information. Machine readability is a desirable feature of an information model, which makes it much more useful. Figure 4-1 shows the combined data model used in this standard. The design model is a representation of the detailed characteristics.

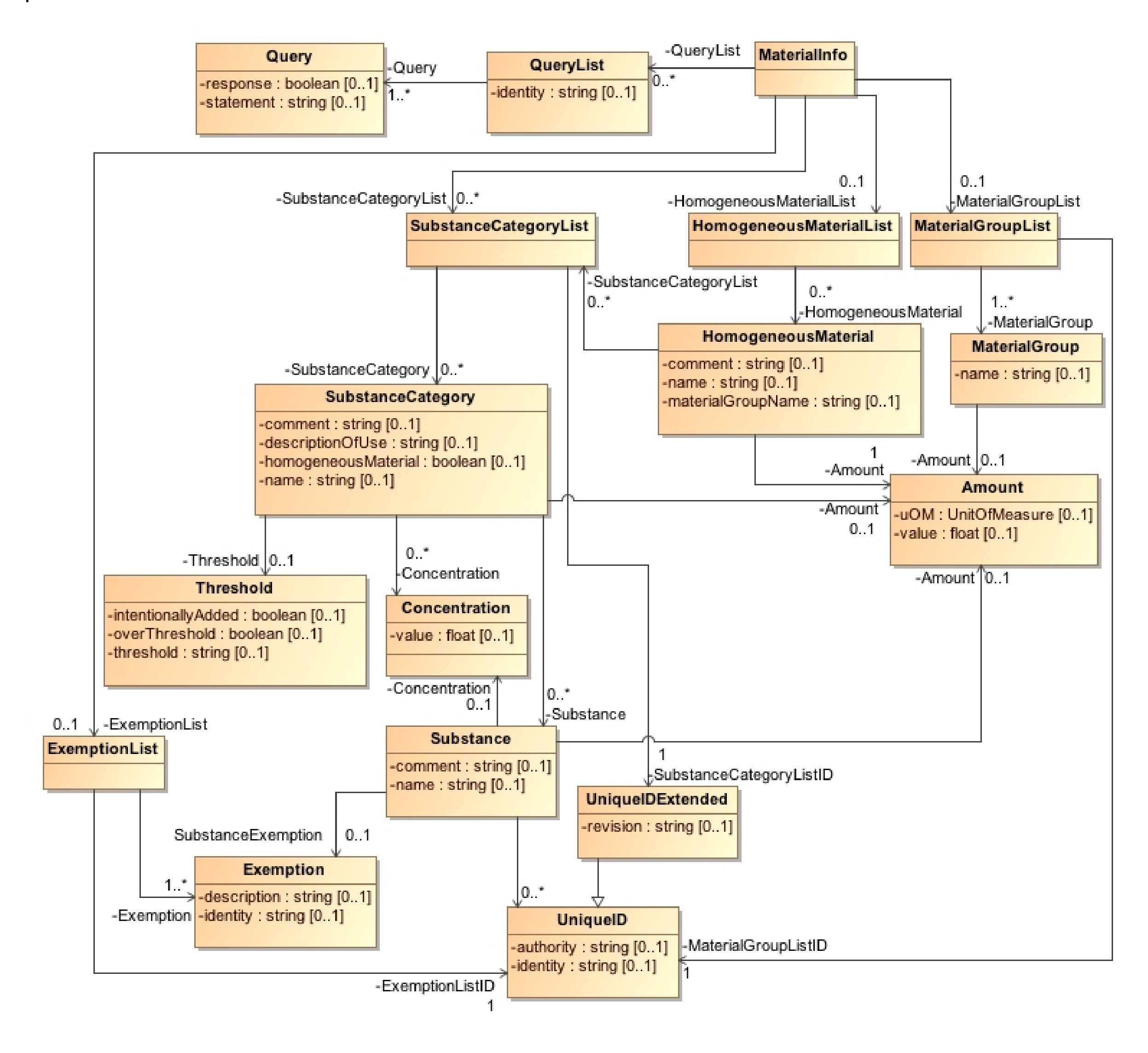


Figure 4-1 Design Data Model for IPC-1752 Material Declaration Requirements

UML was chosen for this project as it is commonly used among software developers. While information models abstractly describe the fundamental information itself, grammars are composed of “production rules” which describe how the information can be written: this is also called serialization or marshalling. Grammars are useful for validating information, but they only contain a subset of the meta-information found in a well constructed information model. The grammar used in this standard is an XML Schema. The schema is shown in Appendix E.

4.1 Machine Readable Formats

Ideally, a machine-readable information model would be programmatically converted into:

- The grammars necessary to transport information
- Skeletal computer code used to manipulate information
- The Structured Query Language (SQL) statements necessary to define the structure of relational database that store information
- Database stored procedures used to ensure the validity of the data

4.2 Data Model for Materials Declaration

The data model for the declaration standard is not complex; however, there are many relationships and linkages that need to be addressed and established. Data modeling can improve the characteristics of any form or any programming that is developed at the requester's site or the responder's location.

Appendix E shows the characteristics of the UML model for the materials declaration standard. The details of Appendix E represent an analytical model of the concepts desired for any declaration scheme. The design model establishes a functional representation of the requirements.

5 MULTIPLE PRODUCT SUPPORT

IPC-1751 Version 2.0 enables identification of multiple products to which associated sectional declarations apply.

If the 1752 declaration is to pertain to multiple products as identified in the 1751 sectional, one of the following use cases **shall** apply to the group of identified products, and any restrictions stated under each use case **shall** be observed, such that the declaration remains true and representative of all included products.

Multiple Product Use Cases

For the purposes of this standard, multiple product declarations may consist of one of the following four use cases:

1) Included products have same mass and material content;
2) Included products have different mass with the same material content;
3) Included products have same mass with different material content; and
4) Included products have different mass and different material content.

Case #1 – Same Mass & Same Material Content

Use Case 1 considers a grouping of reported products where all of the products are identical in body mass and material content. Most often this scenario is associated with a family grouping of products. Class A, B, C and D are fully supported in this case.

Case #2 – Different Mass & Same Material Content

Use Case 2 considers a grouping of reported products where all of the products have different masses but are identical in material content. Most often this scenario is associated with a family grouping of products that are composed of the same materials, but vary in body size or number of repeatable products. This case supports a Class A declaration for multiple parts. When different masses are assigned to different product IDs and all material content, mass values are reported in mass percent, Class B, Class C, and Class D may be used.

Examples:

- A family of hardware products (screw, nut, bolt, etc.) with identical material content but different diameters, length, or other size variables that cause mass variations
- Chassis of different sizes made of same materials
- Uncoated wire: single strand, double strand, n strand

Case #3 – Same Mass & Different Material Content

Use Case 3 considers a grouping of reported products where all the products have the same mass value, but for each product the material content is different. This scenario is possible if the products are produced in different manufacturing facilities with different raw or processed material sources. This case supports a single response using a Class A declaration for multiple parts. Class B, Class C and Class D responses **shall** require unique material declarations for each product of different material content.

Examples:

- A group of 0402 surface mounted ceramic capacitors manufactured at various locations where each location has differing content material sources of the same mass
- An 8-pin SOIC with multiple assembly locations where the components are purchased from a variety of locations where each location has differing content material sources of the same mass
- An 0402 NPO capacitor vs. an 0402 X7R capacitor of the same mass

Case #4 – Different Mass & Different Material Content

Use Case 4 considers a grouping of reported products where all the products have different masses and different material content. Most often this scenario will not involve families of products, but involve a set of products with no real commonality between them. This case supports a single response using a Class A declaration for multiple parts. Class B, Class C and Class D responses **shall** require unique material declarations for each product of different material content.

Examples:

- A list of components used to assembly a power module
- A list of components used to create a wiring harness
- A list of products purchased from a supplier with a wide range of product offerings (capacitors, resistors, connectors, etc.)
- A family of resistors manufactured at various locations where each location has differing raw material sources
- A list of wires with different UL descriptions
- A family of connectors with different contact material options: gold, phosphorus bronze, etc.
- A family of products (comprised of multiple parts and components): servers with different memory capacity, memory modules with different capacity

6 DESCRIPTION OF THE DATA FIELDS

The 1752 standard is supported by an XML schema and a UML model. The materials declaration standard supports various levels of materials disclosure, consistent with the four material declaration classes.

The sections below describe the data fields that will be seen by a user, organized sequentially based on the sectional structure. Software developers **shall** use the XML schema and detailed attribute tables to build a 175x compliant software tool.

6.1 Declaration Query/Reply (Class A)

1752 provides the user with the ability to respond to queries which are either defined as standard queries in this standard or optionally may be added by the requester or supplier for information not covered by the standard declaration queries. Presently there are four query lists provided:

1. EU RoHS;
2. Full JIG-101;
3. REACH substances as applied to electronics per JIG-101; and
4. REACH substances not listed within the JIG-101.

Query lists may change as described in Appendix F. When legislation is updated, IPC will amend query lists accordingly. Each query is a statement, and the response is a true or false answer. An example of the Query List dropdown is shown in Figure 6-1. More than one query list may be chosen if needed.

Although the query list fields are *optional*, they become ***mandatory*** when the requester requires verification of a commitment by the responding authority.

Note: Effective Date is an *optional* field in IPC-1751. If no effective date is provided, the response date becomes the default effective date of the 1752 response.

Add Query List	Drop Down List ▼
	EU RoHS-0508
	JIG-101-0409
	REACH-0209perJIG-101
	REACH-0209notlistedinJIG-101
	Custom

Figure 6-1 Example of a Query List

Note: The MMYY format after the Legislation listed in the drop down is for the month and year the legislation became effective.

Following are the standard query lists.

6.1.1 EU RoHS

This section provides the details of the EU RoHS declaration. It also provides an opportunity for the provider of the data to identify any of the exemptions that are known to be applicable to the product identified in the declaration. Exemptions are established by the EU RoHS Directive and are as defined in the declaration. There are five EU RoHS declaration statements, as described in sections 6.1.1.1 to 6.1.1.5 below. An example of an EU RoHS status query is shown below in Figure 6-2.

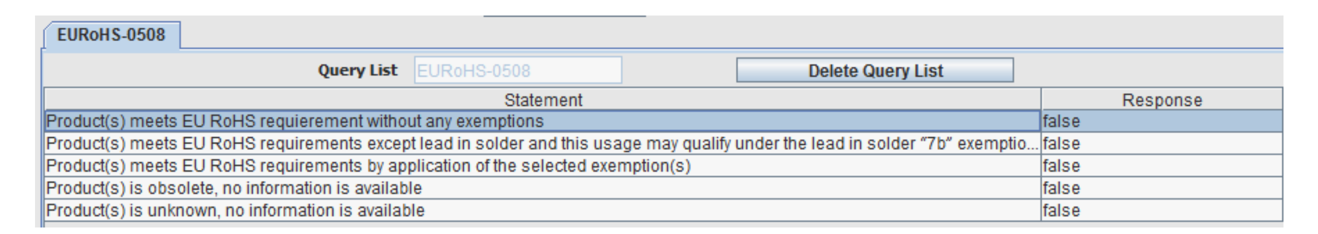


Figure 6-2 Example of EU RoHS Status Query

6.1.1.1 Product meets EU RoHS requirements without any exemptions

This is a declaration that the product(s) described in the declaration contains no RoHS restricted substances above the homogeneous material concentration threshold level per the RoHS Directive. This selection is only appropriate if no exemptions apply and the product conforms to the RoHS Directive.

6.1.1.2 Product meets EU RoHS requirements except lead in solder and this usage may qualify under the lead in solder "7b" exemption (other selected exemptions may apply)

Suppliers of raw materials, components, sub-assemblies and assemblies may not know if the product(s) being declared will be used as a 7b exemption. By using this declaration, the supplier is indicating that the product(s) contains lead in solder, and the product usage may qualify as a 7b exemption. Other exemptions may also exist but may be so indicated per 6.1.2. This declaration statement is for suppliers, not producers of servers, storage and storage array systems.

6.1.1.3 Product meets EU RoHS requirements by application of the selected exemption(s)

This is a declaration that the product(s) described in the declaration does contain one or more EU RoHS restricted substances above the homogeneous material concentration threshold level per the EU RoHS Directive, but that there is an official exemption which applies to the product. Exemptions which a supplier knows to be available will be disclosed. See Appendix B for a list of exemptions. An example of the exemption list is shown in Figure 6-3.

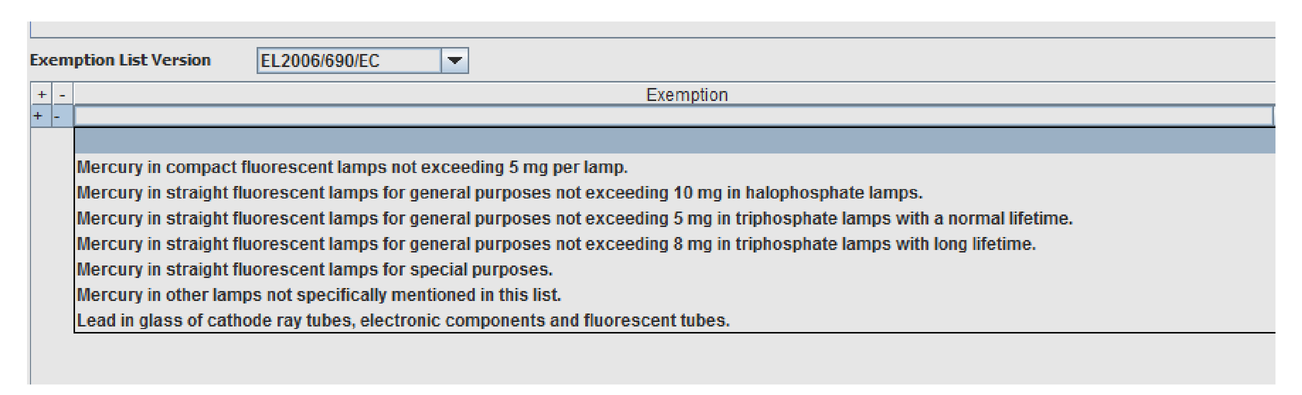


Figure 6-3 Example of Partial EU RoHS Exemption List and Version of Exemption List

6.1.1.3.1 EU RoHS Exemption List

The RoHS Exemption List consists of a complete list of official exemptions passed into law by the EU. The exemptions list is based on the EU RoHS Directive exemptions in place at the time of release. Materials declarations are based on the most current exemption list when the data was provided. See Appendix B for the normative exemption list. Updates will be made per Appendix F.

6.1.1.4 Product fails to meet EU RoHS requirements

This is a declaration that the product(s) described in the declaration does contain one or more RoHS restricted substances above the homogeneous material concentration limit per the RoHS Directive, and there are no official exemptions known to the supplier which allow such content.

6.1.1.5 Product is unknown/obsolete, no information is available

This is a declaration that, while the supplier acknowledges the product(s) for which data has been requested, the product is no longer manufactured by the supplier and no information on material content is available. This is sometimes the case for obsolete products, because composition data at the homogeneous material level was not historically measured by suppliers unless it was required for quality purposes.

6.1.2 The Joint Industry Guide (JIG)-101

As stated in the scope of the JIG-101:

> *"This Guide [JIG-101] represents industry-wide consensus on the relevant materials and substances that shall be disclosed by suppliers when those materials and substances are present in products that are incorporated into electrotechnical products. The Guide [JIG-101] benefits suppliers and their commercial customers by providing consistency and efficiency to the material declaration process and will promote the development of consistent data exchange formats and tools that will facilitate and improve data transfer along the entire global supply chain. It applies to business-to-business transactions. It is not intended to be used by the general public when making purchasing decisions."*

The Joint Industry Guide (JIG)-101 contains REACH Candidate List SVHCs relevant to electrical and electronic products but does not contain the full Candidate list. As stated by the JIG-101, "As REACH regulates chemical across all industries, not all of the substances publicized on the candidate list occur in products of the electrotechnical industry. Therefore, this Guide [JIG-101] introduces a generic screening methodology. This screening methodology allows identifying only those substances that are relevant for the electrotechnical industry product disclosure." For ease of declaration to the full Candidate list, the IPC-1752 standard contains a list of SVHCs as determined by the JIG-101 and a secondary list of the remaining SVHCs not likely to be contained in electronic products. These are based on the SVHCs published in the "Candidate List of Substances of Very High Concern for authorization" and will be updated regularly. See Appendix C.

6.1.3 REACH (Registration, Evaluation, and Authorisation of Chemicals)

In some cases, REACH may require a company to communicate with its European Union customers regarding the presence of certain "Substances of Very High Concern" (SVHC) in the company's "articles" (as the quoted terms are defined by REACH). SVHCs are defined in Article 57 of Regulation (EC) 1907/2006, and the list of certain SVHCs is the "Candidate List of Substances of Very High Concern for authorization" by the European Chemical Agency (ECHA). A list of these substances can be found at the ECHA website (at publication):

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

6.1.3.1 REACH Candidate List of Substances of Very High Concern is contained/is not contained in product above the limit per the definition within REACH

For absolute clarity two questions are posed here, one the converse of the other. The "true" response **shall** be selected for the statement that describes the product. The "false" response **shall** therefore be required for the converse statement which does not apply to the product. Figure 6-5 shows an example of a REACH query file.

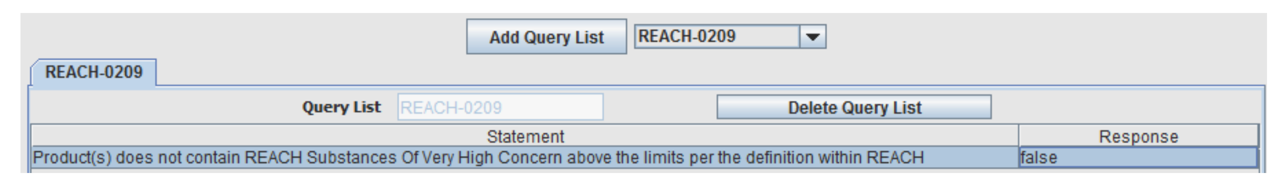


Figure 6-5 Example of REACH Query

6.1.4 Custom Query

The standard supports adding custom queries to the standard EU RoHS and REACH queries. If requesters so desire, they may add specific true/false statements to provide additional feedback from the supplier. Figure 6-6 shows an example of the custom query fields.

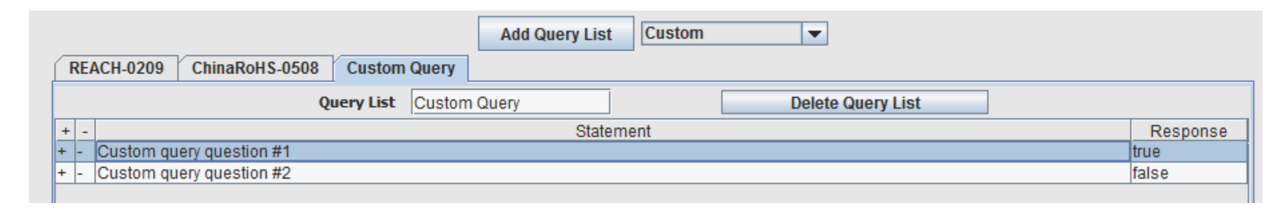


Figure 6-6 Example of Custom Query

6.2 Material Group Declaration (Class B)

This section applies to an *optional* Class B, Material Group Reporting. This section is used to report general composition information about a product. Figure 6-7 shows an example of the Material Group Declaration fields.

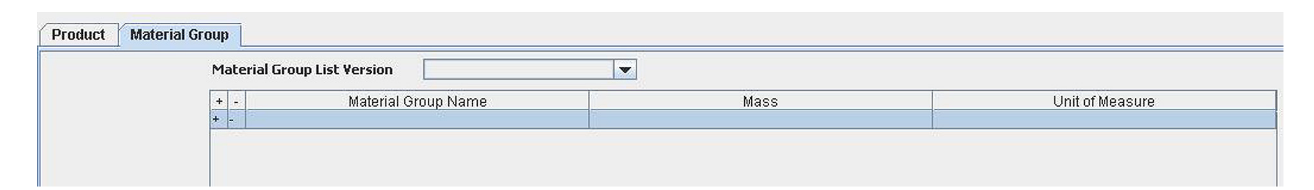


Figure 6-7 Material Group Declaration Example

6.2.1 Material Group List

This field is for a list of material groups. This list is used to define the set of Material Groups from which to choose for the Material Group field.

6.2.2 Material Group

A set of materials selected by reason of importance with respect to legislative, economic, environmental, or other management concern and listed together for the purpose of their management.

6.2.3 Mass

Total mass of the material group contained within the declaration. This field is ***mandatory*** when Material Group is declared.

6.2.4 Unit Measure

The information in this field defines the unit of measure for the material group mass as either milligrams (mg), grams (g), or kilograms (kg).

6.3 Material Composition Summary Declaration – Product Level (Class C)

Class C is used for reporting a summary of types of substances within a product. This section is aligned with the JIG-101 guide and supports the JIG-101 substance categories, RoHS substance categories and REACH SVHC substance categories, as well as allowing custom lists to be added by either the requester (Request/reply) or the supplier (Distribute).

6.3.1 JIG Substance Category List

The threshold levels for declaration are stated in the JIG and are based on global restricted materials regulations. Additional materials for Assessment or Information are included per the rules set by the JIG-

101 and are described in the Appendix C. Figure 6-9 shows an example of this information in presentation format.

Product | Material Summary

☑ 1 - R ☑ 2 - A ☑ 3 - I ☐ RoHS ☐ Reach-SVHC

Level	Category Name	Threshold Level	Above Threshold Level	Mass	UoM	Description of Use	+	-	Conc
R	Asbestos	Intentionally added					+	-	
R	Azocolorants and azodyes which form certain aromatic amines	300 PPM of the finished textile/leat...					+	-	
R	Cadmium/Cadmium compounds **	100 PPM					+	-	
R	Cadmium/Cadmium Compounds - (batteries)	5 PPM of battery					+	-	
R	Chromium VI compounds	1000 PPM of homogeneous mater...					+	-	
R	Diarsenic pentoxide	1000 PPM					+	-	
R	Diarsenic trioxide	1000 PPM					+	-	
R	Fluorinated greenhouse gases (PFC, SF6, HFC)	Intentionally added					+	-	
R	Formaldehyde - (wood)	Intentionally added					+	-	
R	Formaldyhyde - (textiles)	75 PPM of textile					+	-	
R	Hexabromocyclododecane (HBCDD) and all major diastereoi...	1000 PPM					+	-	
R	Lead/lead Compounds	1000 PPM of homogeneous mater...					+	-	
R	Lead/Lead compounds - (children's products)	300 PPM of children's products					+	-	
R	Lead/Lead compounds - (paint and surface coatings of toys)	90 PPM of surface coating					+	-	
R	Lead/Lead compounds - (cables/cords)	300 PPM of surface coating					+	-	
R	Lead/lead compounds - (batteries)	40 PPM of battery					+	-	
R	Mercury/Mercury compounds - (all except batteries)	1000 PPM or Intentionally added					+	-	
R	Mercury/Mercury compounds - (batteries)	1 PPM of battery					+	-	
R	Nickel	Intentionally added					+	-	
R	Ozone Depleting Substances/Isomers	Intentionally added					+	-	
R	Ozone Depleting Substances - Hydrochlorofluorocarbons/Iso...	Intentionally added					+	-	
R	Perchlorates	0.006 PPM					+	-	
R	Perfluorooctane sulfonate (PFOS)	Intentionally added					+	-	
R	Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	Intentionally added					+	-	
R	Phthalates DEHP, DBP, BBP	1000 PPM					+	-	
R	Phthalates DINP, DIDP, DNOP	1000 PPM of plasticized material					+	-	
R	Polybrominated Biphenyls (PBBs)	1000 PPM of homogeneous mater...					+	-	
R	Polybrominated Diphenylethers (PBDEs)	1000 PPM of homogeneous mater...					+	-	
R	Deca-bromodiphenylether (Deca-BDE)	Intentionally added					+	-	
R	Polychlorinated Terphenyls (PCTs)	Intentionally added					+	-	
R	Polychlorinated Biphenyls (PCBs) and specific substitutes	Intentionally added					+	-	
R	Polychlorinated Naphthalenes (more than 3 chlorine atoms)	Intentionally added					+	-	
R	Radioactive Substances:Shortchain	Intentionally added					+	-	
R	Shortchain Chlorinated Paraffins (C10 - C13)	1000 PPM					+	-	
R	Certain Tributyl Tin (TBT) and Triphenyl Tin (TPT)	Intentionally added					+	-	
R	Tributyl Tin Oxide (TBTO)	1000 PPM or Intentionally added					+	-	
A	Tris (2-chloroethyl) phosphate(TCEP)	1000 PPM					+	-	
I	Berylium Oxide (BeO)	1000 PPM					+	-	
I	Brominated Flame Retardants (other than PBBs, PBDEs, or H...	1000 PPM					+	-	
I	Polyvinyl Chloride (PVC)	1000 PPM					+	-	

Figure 6-9 JIG-101 Material Composition Declaration

If the maximum concentration of any substances in the product exceeds the threshold level shown in the table, the supplier should report accordingly. Where threshold levels include the words "intentionally added," substances **shall** be declared if they are added intentionally to any part or material of the product, regardless of concentration level.

6.3.1.1 RoHS Substances in JIG-101 Substance Category List

For each EU RoHS substance above the threshold level, the supplier **shall** report the worst case concentration at the homogeneous material level and optionally the total mass of the substance in the product. For reporting to regulatory homogeneous levels, multiple lines for a given substance can be added if a substance is contained in more than one homogeneous material. Any instance over the threshold **shall** be reported. If an exemption applies, this **shall** be reported as well.

Suppliers may be requested or choose to provide a description of where, why or how the substance is used in the product.

Homogeneous Example #1: EU RoHS Homogeneous requirement for Lead (Pb)

Homogenous Material 1:
Mass of Lead (Pb) = 0.01 g,
Mass of Homogeneous material = 1 g
Concentration of Lead (Pb) = 0.01 g / 1 g = 1.0%

Homogenous Material 2:
Mass of Lead (Pb) = 0.001 g,
Mass of Homogeneous material = 10 g
Concentration of Lead (Pb) = 0.001 g / 10 g = 0.01%

Total mass of component: 1g + 10 g = 11 g
Total mass of Lead (Pb) = 0.01 g + 0.001 g = 0.011 g

Answer: Total mass of Lead (Pb) = 0.011 g
Worst Case Concentration of Lead (Pb) = 1.0%

6.3.1.2 Non-RoHS Substances in JIG-101 Substance Category List

For each non-RoHS substance above the threshold level, the total mass of a substance in a Class C declaration is ***mandatory*** and is reported in milligrams, grams, kilograms, or mass percent relative to product ID mass representing the total of that substance in all materials in the product. Suppliers may be requested or choose to provide a description of where, why or how the substance is used in the product.

Component Example #2: Total mass of restricted material: Phthalates

Mass of Phthalates in material 1 = 0.02 g
Mass of Phthalate in material 2 = 0.002 g

Total mass of component = 20 g
Total mass of Phthalates in component = 0.02 g + 0.002 g = 0.022 g
Concentration of Phthalates = 0.022 g / 20 g = 0.11%

Answer: Mass of Phthalates in component = 0.022 g
Concentration in component = 0.11%

6.3.1.3 REACH Substances in JIG-101 Substance Category List

The list of certain REACH substances that may be contained in electrotechnical products required under the JIG-101 have been selected per the REACH Screening Methodology within the JIG-101 Ed. 2.0. It specifically states:

"As REACH regulates chemicals across all industries, not all of the substances publicized on the candidate list occur in products of the electrotechnical industry. Therefore, this Guide (JIG-101) introduces a generic screening methodology. This screen methodology allows identifying only those substances that are relevant for the electrotechnical industry product disclosure."

All remaining SVHCs are not required to be listed unless those substances are known to be contained in an article above the 0.1% REACH threshold.

Note: "Supplier information provided based on this 'JIG-101 REACH screening list' does not guarantee compliance with the REACH Regulation for Article 33 communication and Article 72 notification duty for articles. Please consult with legal counsel regarding compliance."

See Appendix C for details.

6.3.2 REACH List

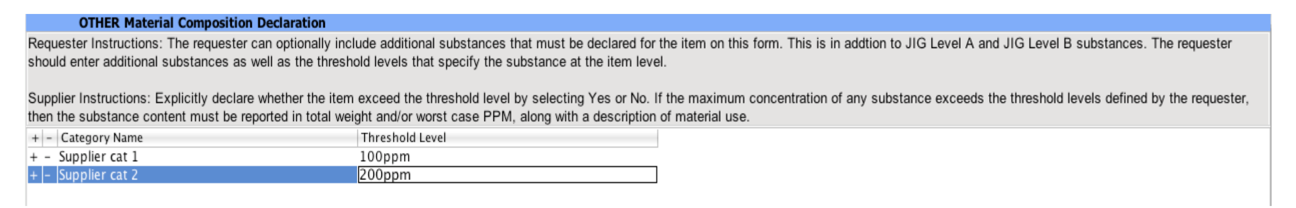
This section applies to Class C and Class D to declare content of the current REACH SVHC (Substances of Very High Concern) candidate list. Essentially, article level reporting by REACH definitions is at the product level as shipped to the requester. REACH SVHC-listed substances can be reported by the substance name with accompanying CAS or EC number and concentration value if contained above 0.1% mass at the article level. See Figure 6-10. See Appendix D.

Level	Category Name	Threshold Level	Above Threshol...	Mass	UoM	Description of Use	+	-	Conc	UoM
Reach-S...	Benzyl butyl phthalate (BBP)	0.1%					+	-		
Reach-S...	Lead hydrogen arsenate	0.1%					+	-		
Reach-S...	Bis(tributyltin)oxide (TBTO)	0.1%					+	-		
Reach-S...	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	0.1%					+	-		
Reach-S...	Hexabromocyclododecane (HBCDD) and all major diastereoi...	0.1%					+	-		
Reach-S...	Bis (2-ethylhexyl)phthalate (DEHP)	0.1%					+	-		
Reach-S...	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	0.1%					+	-		
Reach-S...	Sodium dichromate	0.1%					+	-		
Reach-S...	Diarsenic trioxide	0.1%					+	-		
Reach-S...	Diarsenic pentaoxide	0.1%					+	-		
Reach-S...	Cobalt dichloride	0.1%					+	-		
Reach-S...	Dibutyl phthalate (DBP)	0.1%					+	-		
Reach-S...	4,4'- Diaminodiphenylmethane (MDA)	0.1%					+	-		
Reach-S...	Anthracene	0.1%					+	-		
Reach-S...	Triethyl arsenate	0.1%					+	-		

Figure 6-10 REACH SVHC List (ED/67/2008)

6.4 Additional Substances for Material Composition Declaration – Product Level

This section only applies to Class C. The substance/category name **shall** be specified along with the threshold level. This may be accomplished using the Additional Substances section to add substance categories to the material composition table. If the exchange is a request/reply, the requester provides the additional substance categories; if the exchange is in the Distribute mode, the supplier may add the additional categories. An example of how this might look in a software tool is shown in Figure 6-11.



OTHER Material Composition Declaration

Requester Instructions: The requester can optionally include additional substances that must be declared for the item on this form. This is in addtion to JIG Level A and JIG Level B substances. The requester should enter additional substances as well as the threshold levels that specify the substance at the item level.

Supplier Instructions: Explicitly declare whether the item exceed the threshold level by selecting Yes or No. If the maximum concentration of any substance exceeds the threshold levels defined by the requester, then the substance content must be reported in total weight and/or worst case PPM, along with a description of material use.

+	-	Category Name	Threshold Level
+	-	Supplier cat 1	100ppm
+	-	Supplier cat 2	200ppm

Figure 6-11 Example JIG-101 Other Material Composition Declaration – Product Level

The manner in which additional material composition declaration is requested is by adding category name and threshold level for all substances in which the requester has an interest.

6.4.1 Category Name

The name representing the group of substances goes in this field. This field is ***mandatory***.

6.4.2 Threshold Level

The maximum threshold level expressed in mass % is entered in this field. This value is either a maximum concentration or a mass percent relative to the product based on business need. For banned substances, the level should be based on an industry regulated value when available. This field is ***mandatory***.

6.5 Material Composition Declaration – Homogeneous Material Level (Class D), with JIG-101 (latest revision) list

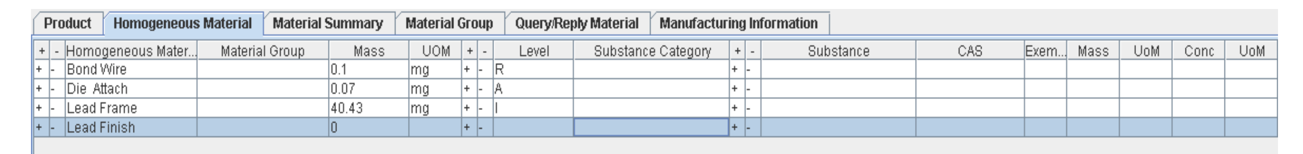
Class D provides capabilities to report substances at the homogeneous material level. For consistency in reporting JIG-101 substances, any software tools developed **shall** include the JIG-101 substances categories, substance lists, and associated CAS numbers per the JIG-101.There are a number of fields associated with this type of declaration, which are described in Figure 6-12.

Product | Homogeneous Material | Material Summary | Material Group | Query/Reply Material | Manufacturing Information

+	-	Homogeneous Mater...	Material Group	Mass	UOM	+	-	Level	Substance Category	+	-	Substance	CAS	Exem...	Mass	UoM	Conc	UoM
+	-					+	-			+	-							
+	-					+	-			+	-							

Figure 6-12 Example JIG-101 Material Composition Declaration - Homogeneous Material Level

The supplier indicates the homogeneous material in which he wants to identify the presence of a substance. An example is an integrated circuit, where the homogeneous materials include the bond wire, die attach, lead frame, lead finish, and molding compound. See Figure 6-13 and paragraphs below.



Product | Homogeneous Material | Material Summary | Material Group | Query/Reply Material | Manufacturing Information

+	-	Homogeneous Mater...	Material Group	Mass	UOM	+	-	Level	Substance Category	+	-	Substance	CAS	Exem...	Mass	UoM	Conc	UoM
+	-	Bond Wire		0.1	mg	+	-	R		+	-							
+	-	Die Attach		0.07	mg	+	-	A		+	-							
+	-	Lead Frame		40.43	mg	+	-	I		+	-							
+	-	Lead Finish		0		+	-			+	-							

Figure 6-13 Example Material Composition Declaration - Homogeneous Material Level

6.5.1 Homogeneous Material Name

The homogeneous materials in each of the products and/or subproducts are identified in this field. In the integrated circuit example they are bond wire, die attach, lead frame, lead finish, and molding compound as shown in Figure 6-15. This field is ***mandatory***.

6.5.2 Material Group

The Material Group field is provided to identify a family or group of materials to which the related homogeneous material substances belongs. Examples of Material Groups might include “halogens” or “phthalates.” This field is alpha-numeric and *optional*.

6.5.2.1 Homogeneous Material - Mass

The information in this field pertains to the total mass of the homogeneous material in that product or subproduct. This field is ***mandatory***.

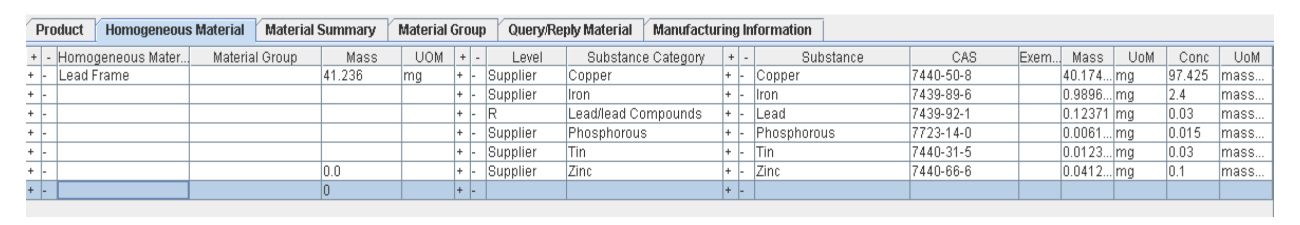
6.5.2.2 Homogeneous Material - Unit of Measure

The information in this field pertains to the unit of measure for the homogeneous material mass; it **shall** be milligrams (mg), grams (g), or kilograms (kg). This field is ***mandatory***.

6.5.3 Substance

6.5.3.1 Level

If any of the JIG-101 Level R, I or A substances is located in the homogeneous materials, each must be declared and identified. Other levels or substance categories may be added by either the requester or supplier. See Figure 6-14. In some implementations a pull-down menu may be provided for assistance. This field is ***mandatory*** for regulated substances as required for accurate reporting of the subject product.



Product | Homogeneous Material | Material Summary | Material Group | Query/Reply Material | Manufacturing Information

+	-	Homogeneous Mater...	Material Group	Mass	UOM	+	-	Level	Substance Category	+	-	Substance	CAS	Exem...	Mass	UoM	Conc	UoM
+	-	Lead Frame		41.236	mg	+	-	Supplier	Copper	+	-	Copper	7440-50-8		40.174...	mg	97.425	mass...
+	-					+	-	Supplier	Iron	+	-	Iron	7439-89-6		0.9896...	mg	2.4	mass...
+	-					+	-	R	Lead/lead Compounds	+	-	Lead	7439-92-1		0.12371	mg	0.03	mass...
+	-					+	-	Supplier	Phosphorous	+	-	Phosphorous	7723-14-0		0.0061...	mg	0.015	mass...
+	-					+	-	Supplier	Tin	+	-	Tin	7440-31-5		0.0123...	mg	0.03	mass...
+	-			0.0		+	-	Supplier	Zinc	+	-	Zinc	7440-66-6		0.0412...	mg	0.1	mass...
+	-			0		+	-			+	-							

Figure 6-14 Homogeneous Material Composition Declaration – Substance Category Identification

6.5.3.2 Substance Category

This field identifies the substance class or grouping of the substance to be declared, from the JIG-101 or others added by the requester or supplier. If other categories are to be added, they **shall** be clearly defined by either the requester or supplier (see Figure 6-15). This field is ***mandatory*** as required for accurate reporting of the subject product.

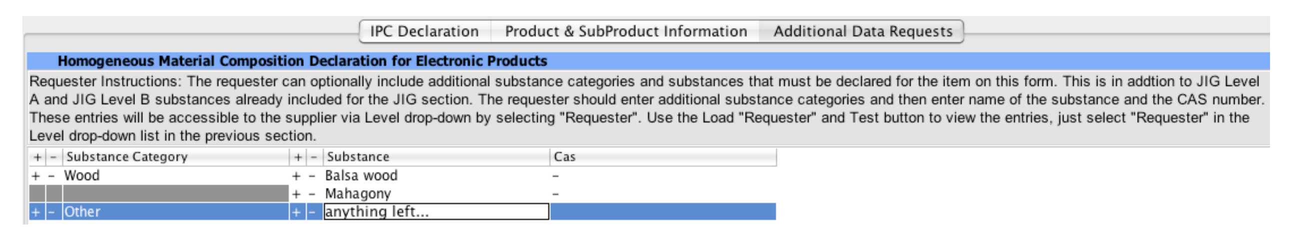


Figure 6-15 Homogeneous Material Composition Declaration – Additional Substance Category

6.5.3.3 Substance

This field identifies the name of the substance being declared. This field is ***mandatory*** as required for accurate reporting of the subject product.

6.5.3.4 Issuing Authority

The authority issuing the substance identity such as CAS (Chemical Abstract Service), EC (European Commission), or IUPAC (International Union of Pure and Applied Chemistry). This field is ***mandatory*** as required for accurate reporting of the subject product. If no issuing authority exists or if chemical identity is confidential, the field becomes *optional* and may be used per convention established between the requester and supplier.

6.5.3.5 Substance Identity

This field identifies the issuing authority's registry number of the chemical compound comprising the substance being reported. This field is ***mandatory*** as required for accurate reporting of the subject product. If no issuing authority number exists or if chemical identity is confidential, the field becomes *optional* and may be used per convention established between the requester and supplier.

6.5.3.6 Exempt

This field identifies an EU RoHS exemption that the product supplier knows applies to the product. If the threshold is above an EU RoHS threshold, this field is ***mandatory*** as required for accurate reporting of the subject product. This field is *optional* if below the EU RoHS threshold.

6.5.3.7 Substance Mass

This field identifies the mass or mass percent (relative to total product mass) of the substance in the homogeneous material. This field is ***mandatory*** as required for accurate reporting of the subject product.

6.5.3.8 Substance Mass Unit of Measure

This field identifies the unit of measure for the substance mass – milligrams (mg), grams (g), or kilograms (kg). This field is ***mandatory***.

6.5.3.9 Concentration

This field identifies the concentration of the substance within a homogeneous material. Concentration is *optional*. If concentration is not present it may be calculated using the substance mass and the homogeneous material mass. The value is expressed in mass %.

6.6 Homogeneous Material Composition Declaration – Requester

This section applies to either Class C or Class D, or both Class C and D as noted. At times a business need might require declaration of additional substances at a homogeneous material level. If this is a

business need by a requester using the request/response process, the requester may also wish to define a threshold level above which a declaration is requested. In these circumstances the substance/category name, substance, and optionally the issuing authority number should be specified.

6.6.1 Substance Category

The substance class or grouping defined by the user is entered in this field. This field is ***mandatory*** for Class D as required for accurate reporting of the subject product.

6.6.2 Substance

The substance name as defined by the user is entered in this field. This field is ***mandatory*** for Class D as required for accurate reporting of the subject product.

6.6.3 Unique ID

The Unique ID field provides a holder for information that uniquely identifies the substance being reported. If the JIG-101 is being used, this is usually the Chemical Abstract Service (CAS) number for the substance. Not all substances or substance compounds will be associated with a CAS number or other Unique ID. In the case of proprietary information, a Unique ID will not be required for disclosure.

The Unique ID requires two pieces of information, the identifier itself and the name of the authority that issued the identifier (in the case of a CAS number the authority is “CAS” and the identity would be the CAS number itself).

This field is *optional* but strongly recommended.

6.6.4 Unique ID Authority

This is the authority that issued and is responsible for the Unique ID. It is ***mandatory*** if the Substance Unique ID is provided.

6.7 Other Documentation

Other types of documentation which may be provided for confirmation include results from third party audits, test results verifying manufacturing process information, specification sheets or other documentation on recommended product alternatives, external confirmations/standards such as ISO (International Standards Organization), etc. All of these documents should be verified. These documents may be embedded in the XML file by using the attachment function of the software tool.

7 IMPLEMENTATION GUIDELINES

7.1 Applicability of 1751 Section 9

All implementation guidelines in IPC-1751 Section 9 **shall** also apply to IPC-1752.

7.2 1752 Rules to Extend Schema Constraints

Rule 1: If <Include>:<Sectionalname="MaterialInfo"> then element <MaterialInfo> shall exist <Include>:<Sectional name="MaterialInfo">:<SubSectional name="A">.

Rule 2: If <Include>:<Sectional name="MaterialInfo">:<SubSectional name="A"> then element <QueryList> shall exist.

Rule 3: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> is required.

Rule 4: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> is required.

Rule 5: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <StatementColumn> is required.

Rule 6: If <Include>:<SubSectional name="A"> then <QueryList>:<ResponseColumn> is required.

Rule 7: If <Include>:<SubSectional name="A"> then <QueryList>:<CloseButton> is required.

Rule 8: If <Include>:<SubSectional name="A"> then <QueryList>:<HighlightButton> is required.

Rule 9: If <QueryList identity="EURoHS-0508"> then <QueryList>:<Query> response attribute default of nil.

Rule 10: If <QueryList identity="EURoHS-0508">then <QueryList>:<Query> response attribute must have one and only one 'true' value.

Rule 11: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> <EUROHS-0508> <Exemption> is required.

Rule 12: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> <REACH-0209> <Response> default of 'false'.

Rule 13: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> <REACH-0209> <Exemption> is not displayed.

Rule 14: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> <Custom> <Statement> must contain at least one line.

Rule 15: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> <Custom> <Response> default of 'false'.

Rule 16: If <Include>:<SubSectional name="A"> then <QueryList>:<AddQueryList> <SelectBox> <Custom> <Exemption> is not displayed <Include>:<Sectional name="MaterialInfo">:<SubSectional name="B">.

Rule 17: If <Include>:<SubSectional name="B"> then element <MaterialGroupList> shall exist.

Rule 18: If <Include>:<SubSectional name="B"> then element <UnitofMeasureList> shall exist.

Rule 19: If <Include>:<SubSectional name="B"> then <MaterialGroup> MaterialGroupListVersionListBox> is required.

Rule 20: If <Include>:<SubSectional name="B"> then <MaterialGroup> <MaterialGroupList> is required.

Rule 21: If <Include>:<SubSectional name="B"> then <MaterialGroup> <MaterialGroupNameColumn> is required.

Rule 22: If <Include>:<SubSectional name="B"> then <MaterialGroup> <MaterialGroupNameList> is required.

Rule 23: If <Include>:<SubSectional name="B"> then <MaterialGroup> <MassColumn> is required.

Rule 24: If <Include>:<SubSectional name="B"> then <MaterialGroup> <UnitofMeasure> is required.

Rule 25: If <Include>:<SubSectional name="B"> then <MaterialGroup> <UnitofMeasure> <UnitofMeasureList> is required.

Rule 26: If <Include>:<SubSectional name="B"> then <MaterialGroup> MaterialGroupListVersionListBox> <IEC_62474> <MaterialGroupList> is required.

Rule 27: If <Include>:<SubSectional name="B"> then <MaterialGroup> MaterialGroupListVersionListBox> <IEC_62474> <UnitOfMeasureList> is required <Include>: <Sectional name="MaterialInfo">: <SubSectional name="C">.

Rule 28: If <Include>:<SubSectional name="C"> then element <SubstanceCategoryList> shall exist.

Rule 29: If <Include>:<SubSectional name="C"> then element <Substance> shall NOT exist within <SubstanceCategoryList> <Include>:<Sectional name="MaterialInfo">:<SubSectional name="D">.

Rule 30: If <Include>:<SubSectional name="D"> then element <HomogeneousMaterialList> shall exist.

Rule 31: If <Include>:<SubSectional name="D"> then element <SubstanceCategoryList> shall exist.

Appendix A

Field Mapping and Descriptions

A1.1 Product/Subproduct Information Part (Product) Information (from 1751)

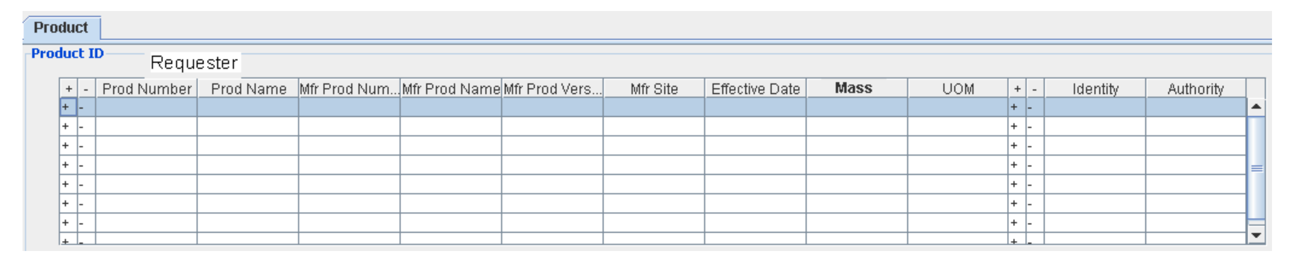


Figure A1-1 Example of Product Information Section as it may appear in an Implementation

Table A1-1 Field Attributes of Product Information Section

Parent Element	Element	Element Type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
Product	ProductID	ProductID	itemName	Mfr Item Name	O	
Product	ProductID	ProductID	itemNumber	Mfr Item Number	M	
Product	ProductID	ProductID	manufacturingSite	Mfr Site	O	
Product	ProductID	ProductID	effectiveDate	Effective Date	O	
Product	ProductID	ProductID	version	Version	O	
Product	ProductID	ProductID	requesterItemName	Requester Item Name	O	
Product	ProductID	ProductID	requesterItemNumber	Requester Item Number	O	
ProductID	Amount	Amount	UOM	UoM	M	
ProductID	Amount	Amount	value	Mass	M	
ProductID	InstanceID	UniqueID	identity	Identity	O	
ProductID	InstanceID	UniqueID	authority	Authority	O	

*M=Mandatory; O=Optional

A1.2 Declaration Query/Reply (Class A)

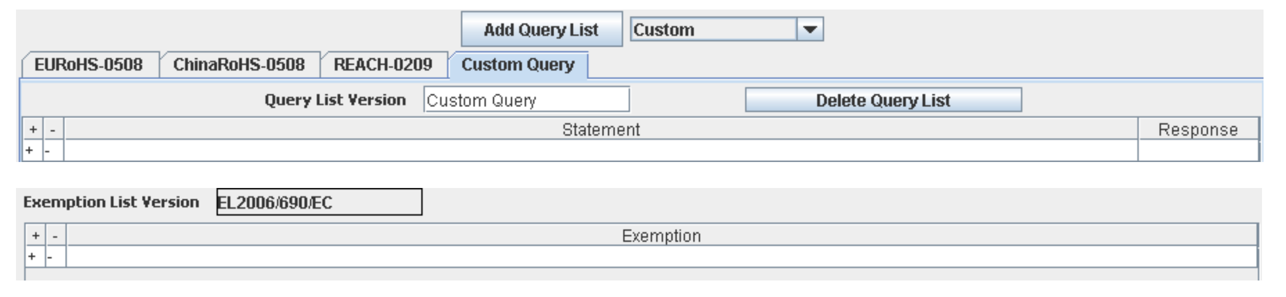


Figure A1-2 Example of Query List as it may appear in an Implementation

Table A1-2 Field Attributes of Class A Query List

Parent Element	Element	Element type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
MaterialInfo	QueryList	QueryList	identity	Query List	M	
QueryList	Query	Query	statement	Statement	M	
QueryList	Query	Query	response	Response	O	Mandatory if reply or distribute
ExemptionList	ExemptionListID	UniqueID	identity	Exemption List Version	O	
ExemptionList	ExemptionListID	UniqueID	authority	NA	O	Defaults to IPC in version 2.0
ExemptionList	Exemption	Exemption	identity-description	Exemption	O	See note 1

*M=Mandatory; O=Optional
Note:
1) concatenate identity and description separated with a dash

A1.3 Material Group Declaration (Class B)

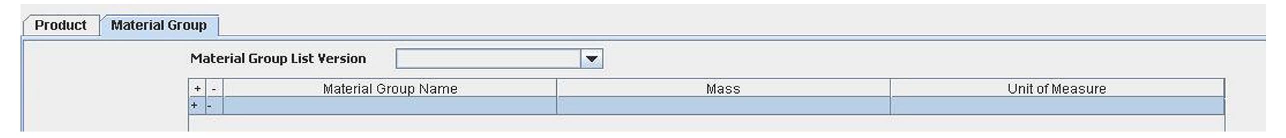


Figure A1-3 Material Group Declaration Example

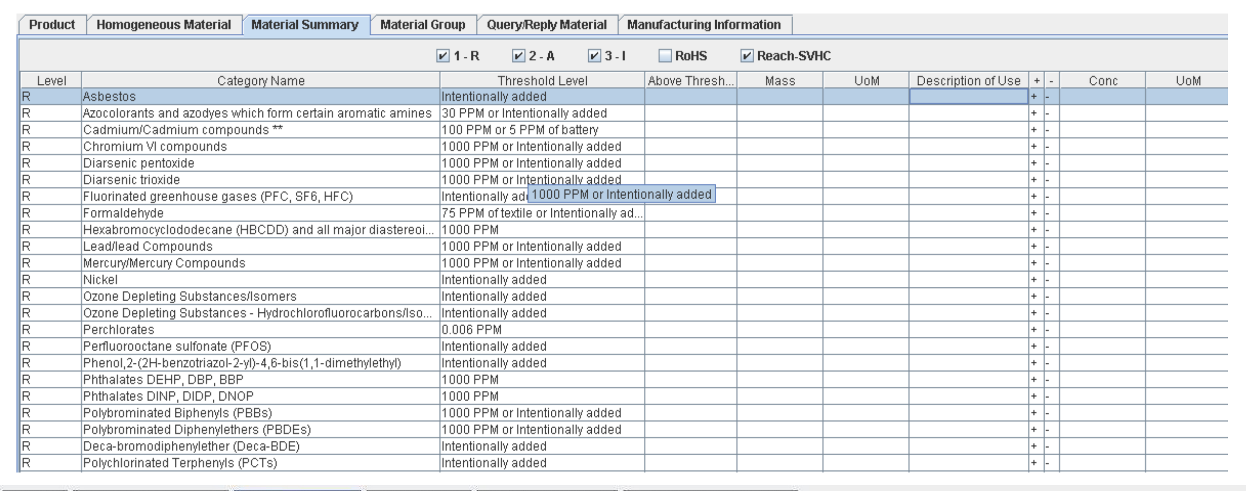
The Class B Material Groups will be released through the IEC 62474 document. Basic information is defined as follows:

Table A1-3 Field Attributes of Class B Material Groups

Parent Element	Element	Element type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
MaterialGroupList	MaterialGroupListID	UniqueID	authority-identity	Material Group List	M	
MaterialGroupList	MaterialGroup	MaterialGroup	name	Material Group	M	
MaterialGroup	Amount	Amount	UOM	UoM	M	
MaterialGroup	Amount	Amount	value	Mass	M	

*M=Mandatory; O=Optional

A1.4 JIG-101 (latest version) – Material Composition Declaration for Electronic Products, Class C



Product | Homogeneous Material | Material Summary | Material Group | Query/Reply Material | Manufacturing Information

☑ 1 - R ☑ 2 - A ☑ 3 - I ☐ RoHS ☑ Reach-SVHC

Level	Category Name	Threshold Level	Above Thresh...	Mass	UoM	Description of Use	+	-	Conc	UoM
R	Asbestos	Intentionally added					+	-		
R	Azocolorants and azodyes which form certain aromatic amines	30 PPM or Intentionally added					+	-		
R	Cadmium/Cadmium compounds **	100 PPM or 5 PPM of battery					+	-		
R	Chromium VI compounds	1000 PPM or Intentionally added					+	-		
R	Diarsenic pentoxide	1000 PPM or Intentionally added					+	-		
R	Diarsenic trioxide	1000 PPM or Intentionally added					+	-		
R	Fluorinated greenhouse gases (PFC, SF6, HFC)	Intentionally ad 1000 PPM or Intentionally added					+	-		
R	Formaldehyde	75 PPM of textile or Intentionally ad...					+	-		
R	Hexabromocyclododecane (HBCDD) and all major diastereoi...	1000 PPM					+	-		
R	Lead/lead Compounds	1000 PPM or Intentionally added					+	-		
R	Mercury/Mercury Compounds	1000 PPM or Intentionally added					+	-		
R	Nickel	Intentionally added					+	-		
R	Ozone Depleting Substances/Isomers	Intentionally added					+	-		
R	Ozone Depleting Substances - Hydrochlorofluorocarbons/Iso...	Intentionally added					+	-		
R	Perchlorates	0.006 PPM					+	-		
R	Perfluorooctane sulfonate (PFOS)	Intentionally added					+	-		
R	Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	Intentionally added					+	-		
R	Phthalates DEHP, DBP, BBP	1000 PPM					+	-		
R	Phthalates DINP, DIDP, DNOP	1000 PPM					+	-		
R	Polybrominated Biphenyls (PBBs)	1000 PPM or Intentionally added					+	-		
R	Polybrominated Diphenylethers (PBDEs)	1000 PPM or Intentionally added					+	-		
R	Deca-bromodiphenylether (Deca-BDE)	Intentionally added					+	-		
R	Polychlorinated Terphenyls (PCTs)	Intentionally added					+	-		

Product | Homogeneous Material | Material Summary | Material Group | Query/Reply Material | Manufacturing Information

☑ 1 - R ☑ 2 - A ☑ 3 - I ☑ RoHS ☑ Reach-SVHC

Level	Category Name	Threshold Level	Above Threshold Le...	Mass	UoM	Description of Use	+	-	Conc
R	Asbestos	Intentionally added					+	-	
R	Azocolorants and azodyes which form certain aromatic amines	300 PPM of the finished textile/leat...					+	-	
R	Cadmium/Cadmium compounds **	100 PPM					+	-	
R	Cadmium/Cadmium Compounds - (batteries)	5 PPM of battery					+	-	
R	Chromium VI compounds	1000 PPM of homogeneous mater...					+	-	
R	Diarsenic pentoxide	1000 PPM					+	-	
R	Diarsenic trioxide	1000 PPM					+	-	
R	Fluorinated greenhouse gases (PFC, SF6, HFC)	Intentionally added					+	-	
R	Formaldehyde - (wood)	Intentionally added					+	-	
R	Formaldyhyde - (textiles)	75 PPM of textile					+	-	
R	Hexabromocyclododecane (HBCDD) and all major diastereoi...	1000 PPM					+	-	
R	Lead/lead Compounds	1000 PPM of homogeneous mater...					+	-	
R	Lead/Lead compounds - (children's products)	300 PPM of children's products					+	-	
R	Lead/Lead compounds - (paint and surface coatings of toys)	90 PPM of surface coating					+	-	
R	Lead/Lead compounds - (cables/cords)	300 PPM of surface coating					+	-	
R	Lead/lead compounds - (batteries)	40 PPM of battery					+	-	
R	Mercury/Mercury compounds - (all except batteries)	1000 PPM or Intentionally added					+	-	
R	Mercury/Mercury compounds - (batteries)	1 PPM of battery					+	-	
R	Nickel	Intentionally added					+	-	
R	Ozone Depleting Substances/Isomers	Intentionally added					+	-	
R	Ozone Depleting Substances - Hydrochlorofluorocarbons/Iso...	Intentionally added					+	-	
R	Perchlorates	0.006 PPM					+	-	
R	Perfluorooctane sulfonate (PFOS)	Intentionally added					+	-	
R	Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	Intentionally added					+	-	
R	Phthalates DEHP, DBP, BBP	1000 PPM					+	-	
R	Phthalates DINP, DIDP, DNOP	1000 PPM of plasticized material					+	-	
R	Polybrominated Biphenyls (PBBs)	1000 PPM of homogeneous mater...					+	-	
R	Polybrominated Diphenylethers (PBDEs)	1000 PPM of homogeneous mater...					+	-	
R	Deca-bromodiphenylether (Deca-BDE)	Intentionally added					+	-	
R	Polychlorinated Terphenyls (PCTs)	Intentionally added					+	-	
R	Polychlorinated Biphenyls (PCBs) and specific substitutes	Intentionally added					+	-	
R	Polychlorinated Naphthalenes (more than 3 chlorine atoms)	Intentionally added					+	-	
R	Radioactive Substances:Shortchain	Intentionally added					+	-	
R	Shortchain Chlorinated Paraffins (C10 - C13)	1000 PPM					+	-	
R	Certain Tributyl Tin (TBT) and Triphenyl Tin (TPT)	Intentionally added					+	-	
R	Tributyl Tin Oxide (TBTO)	1000 PPM or Intentionally added					+	-	
A	Tris (2-chloroethyl) phosphate(TCEP)	1000 PPM					+	-	
I	Berylium Oxide (BeO)	1000 PPM					+	-	
I	Brominated Flame Retardants (other than PBBs, PBDEs, or H...	1000 PPM					+	-	
I	Polyvinyl Chloride (PVC)	1000 PPM					+	-	
RoHS	Lead/Lead compounds **	1000 PPM or Intentionally added					+	-	
RoHS	Mercury/Mercury compounds **	1000 PPM or Intentionally added					+	-	
RoHS	Cadmium/Cadmium Compounds **	75 PPM or Intentionally added					+	-	
RoHS	Hexavalent Chromium/Hexavalent Chromium Compounds **	1000 PPM or Intentionally added					+	-	
RoHS	Polybrominated Biphenyls (PBBs)**	1000 PPM or Intentionally added					+	-	
RoHS	Polybrominated Diphenylethers(PBDEs) **	1000 PPM or Intentionally added					+	-	
Reach-S...	Benzyl butyl phthalate (BBP)	1000 PPM					+	-	
Reach-S...	Lead hydrogen arsenate	1000 PPM					+	-	
Reach-S...	Bis(tributyltin)oxide (TBTO)	1000 PPM					+	-	
Reach-S...	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	1000 PPM					+	-	
Reach-S...	Hexabromocyclododecane (HBCDD) and all major diastereoi...	1000 PPM					+	-	
Reach-S...	Bis (2-ethylhexyl)phthalate (DEHP)	1000 PPM					+	-	
Reach-S...	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	1000 PPM					+	-	
Reach-S...	Sodium dichromate	1000 PPM					+	-	
Reach-S...	Diarsenic trioxide	1000 PPM					+	-	
Reach-S...	Diarsenic pentaoxide	1000 PPM					+	-	
Reach-S...	Cobalt dichloride	1000 PPM					+	-	
Reach-S...	Dibutyl phthalate (DBP)	1000 PPM					+	-	
Reach-S...	4,4'- Diaminodiphenylmethane (MDA)	1000 PPM					+	-	
Reach-S...	Anthracene	1000 PPM					+	-	
Reach-S...	Triethyl arsenate	1000 PPM					+	-	

Note: Product name and number information is pulled from the 1751 data fields.

Figure A1-4 Material Information Option C: Material Declaration [SubstanceCategoryList]

Table A1-4 Field Attributes of Class C Material Declaration

Parent Element	Element	Element Type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
SubstanceCategory ListID	SubstanceCategory ListID	UniqueIDExtended	authorizer-identity-revision	Level	M	See note 1
SubstanceCategory List	SubstanceCategory	SubstanceCategory	name	Category Name	M	
SubstanceCategory List	SubstanceCategory	SubstanceCategory	descriptionOfUse	Description of Use	O	
SubstanceCategory	Threshold	Threshold	overThreshold	Above Threshold Level	M	
SubstanceCategory	Threshold	Threshold	Threshold	Threshold Level	M	
SubstanceCategory	Amount	Amount	UOM	UoM	O	
SubstanceCategory	Amount	Amount	value	Mass	O	
SubstanceCategory	Concentration	Concentration	value	Conc	O	

*M=Mandatory; O=Optional
Notes:
1) concatenate three attributes together separated by a dash

A1.5 Material Composition Declaration – Homogeneous Material Level (Class D) with JIG-101 (latest revision) list

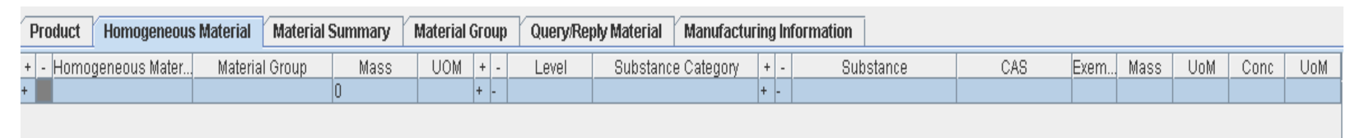


Figure A1-5 Material Information Option D: Homogeneous Material Declaration

Table A1-5 Field Attributes of Class D Declaration

Parent Element	Element	Element Type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
MaterialInfo	Homogeneous Material List	Homogeneous MaterialList	name	Homogeneous Material	M	
MaterialInfo	Homogeneous MaterialList	Homogeneous MaterialList	materialGroup Name	Material Group	O	
Homogeneous Material	Amount	Amount	value	Mass	M	
Homogeneous Material	Amount	Amount	UOM	UoM	M	
SubstanceCategory List	SubstanceCategory ListID	UniqueIDExtended	authority-identity-revision	Level	M	See note 1
SubstanceCategory List	SubstanceCategory	SubstanceCategory	name	Substance Category	M	
SubstanceCategory	Substance	Substance	name	Substance	M	
Substance	SubstanceID	UniqueID	identity	CAS	O	
Substance	SubstanceID	UniqueID	authority	NA	NA	See note 2
Substance	Amount	Amount	value	Mass	M	
Substance	Amount	Amount	UOM	UoM	M	
Substance	Concentration	Concentration	value	Conc	O	
	SubstanceExemption	Exemption	identity-description	Exempt	O	See note 3

*M=Mandatory; O=Optional; NA=Not applicable
Notes:
1) concatenate three attributes together separated by a dash
2) SubstanceID authority defaults to CAS in v2.0
3) concatenate identity and description separated by a dash

Table A1-6 Other Material Composition Declaration for Material Summary (Class C)

Parent Element	Element	Element Type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
SubstanceCategoryList	SubstanceCategory	SubstanceCategory	name	Category Name	M	See note 1
SubstanceCategoryList	Threshold	Threshold	threshold	Threshold Level	M	See note 1
SubstanceCategoryList	SubstanceCategoryListID	UniqueID	identity	NA	NA	See note 2
SubstanceCategoryList	SubstanceCategoryListID	UniqueID	authority	NA	NA	See note 2

*M=Mandatory; O=Optional; NA=Not applicable
Notes:
1) gets loaded into the material summary table
2) defaults to "Other"

Table A1-7 Additional Materials For Homogeneous Material Composition Declaration (Class D)

Parent Element	Element	Element Type	Attribute	Display Label	M/O*	Add'l Information for Solution Providers
SubstanceList	SubstanceCategory	SubstanceCategory	name	Substance Category	M	
SubstanceCategory	Substance	Substance	name	Substance	M	
Substance	SubstanceID	UniqueID	identity	CAS	O	
Substance	SubstanceID	UniqueID	authority	NA	NA	See note 1

*M=Mandatory; O=Optional; NA=Not applicable
Notes:
1) SubstanceID authority defaults to CAS in v2.0 – only needed if identity exists

A2 Additional Material Composition Declaration) (Additional Substance Reporting beyond JIG-101 Substances), Class C

IPC Attribute	Mandatory	Description
List Authority	Yes	The entity responsible for the additional substance category list
List Name	Yes	An alphanumeric identify defined by the list authority that uniquely identifies the unique substance category list
Substance Category	Yes	The substance class or grouping defined by the user
Substance	Yes	The substance name as defined by the user
Issuing Authority	No	Authority issuing the substance or substance compound reference number
Issuing Authority number	No	The chemical number provided by the issuing authority, such as CAS or EU Commission number for substances in the EC inventory * Not all substances or substance compounds will be associated with an Issuing Authority number. In the case of proprietary information, an Issuing Authority number will not be required for disclosure.

A3 Material Group Reporting

IPC Attribute	Mandatory	Description
Material Group List Authority	Yes	The entity responsible for the additional substance category list
Material Group List Name	Yes	An alphanumeric string defined by the list authority that uniquely identifies the list of material groups that **shall** be chosen from
Material Group	Yes	The name of the material group as it appears on the Material Group List
Mass	Yes	The mass of the sum of materials in the material group in the product
Unit of Measure	Yes	The unit of measure for the mass of the material group in the product

Appendix B

RoHS Substances and Exemptions List

EU RoHS Directives continue to be updated over time. As these changes are made, the most current exemption list will be added within the 1752 in a reasonable amount of time. Revision control will be based on the EU Directive document number. Declarations for products that have been previously declared will only be relative to the current EU Exemptions when the data was provided. Updates to the latest EU RoHS exemption list will be a decision between requestor and supplier.

Table B1-1 RoHS Substances

Level	Category Name
EU-RoHS	Cadmium/Cadmium Compounds
EU-RoHS	Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE)
EU-RoHS	Hexavalent Chromium/ Hexavalent Chromium Compounds
EU-RoHS	Lead/Lead Compounds
EU-RoHS	Mercury/Mercury Compounds

B4 Exemption V4

Unique ID Authority == IPC
Unique ID == EL2009/443/EC

Identity	IPC Attribute
1	Mercury in compact fluorescent lamps not exceeding 5 mg per lamp
2a	Mercury in straight fluorescent lamps for general purposes not exceeding: — halophosphate 10 mg
2b	Mercury in straight fluorescent lamps for general purposes not exceeding: — triphosphate with normal lifetime 5 mg
2c	Mercury in straight fluorescent lamps for general purposes not exceeding: — triphosphate with long lifetime 8 mg
3	Mercury in straight fluorescent lamps for special purposes
4	Mercury in other lamps not specifically mentioned in this Annex
5	Lead in glass of cathode ray tubes, electronic components and fluorescent tubes
6	Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminum containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight
7a	— Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)
7b	— lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications
7c	— lead in electronic ceramic parts (e.g. piezoelectronic devices)
8	Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC (1) amending Directive 76/769/EEC (2) relating to restrictions on the marketing and use of certain dangerous substances and preparations
9	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
9a	DecaBDE in polymeric applications. Exemption ended 30 June 2008
9b	Lead in lead-bronze bearing shells and bushes
11	Lead used in compliant pin connector systems
12	Lead as a coating material for the thermal conduction module c-ring
13	Lead and cadmium in optical and filter glass

Identity	IPC Attribute
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
16	Lead in linear incandescent lamps with silicate coated tubes
17	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications
18	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb) as well as when used as specialty lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb)
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL)
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD)
21	Lead and cadmium in printing inks for the application of enamels on borosilicate glass
22	Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communication systems until 31 December 2009
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
25	Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes
26	Lead oxide in the glass envelope of Black Light Blue (BLB) lamps
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers
28	Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection and Electromagnetic Interference Shielding in equipment falling under category three of Directive 2002/96/EC (IT and telecommunications equipment). Exemption granted until 1 July 2007.
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (1)
30	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more
31	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
33	Lead in solders for the soldering of thin copper wires of 100 μm diameter and less in power transformers
34	Lead in cermet-based trimmer potentiometer elements
35	Cadmium in photoresistors for optocouplers applied in professional audio equipment until 31 December 2009
36	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display until 1 July 2010
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body
38	Cadmium and cadmium oxide in thick film pastes used on aluminum bonded beryllium oxide

B3 **Exemption V3**

Unique ID Authority == IPC
Unique ID == EL2006/690/EC-07-2008

Identity	IPC Attribute
1	Mercury in compact fluorescent lamps not exceeding 5 mg per lamp
2a	Mercury in straight fluorescent lamps for general purposes not exceeding 10 mg in halophosphate lamps.
2b	Mercury in straight fluorescent lamps for general purposes not exceeding 5 mg in triphosphate lamps with a normal lifetime.
2c	Mercury in straight fluorescent lamps for general purposes not exceeding 8 mg in triphosphate lamps with long lifetime.
3	Mercury in straight fluorescent lamps for special purposes
4	Mercury in other lamps not specifically mentioned in this Annex
5	Lead in glass of cathode ray tubes, electronic components and fluorescent tubes
6a	Lead as an alloying element in steel containing up to 0.35 % lead by weight
6b	Lead as an alloying element in aluminum containing up to 0.4 % lead by weight
6c	Lead as an alloying element in copper containing up to 4 % lead by weight
7a	Lead in high melting temperature type solders (i.e. lead based solder alloys containing 85 % by weight or more lead)
7b	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications
7c	Lead in electronic ceramic parts (e.g. piezoelectronic devices)
8	Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations
9	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators.
9a	Lead in lead-bronze bearing shells and bushes
11	Lead used in compliant pin connector systems
12	Lead as a coating material for a thermal conduction module c-ring.
13a	Lead in optical and filter glass
13b	Cadmium in optical and filter glass
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
16	Lead in linear incandescent lamps with silicate coated tubes.
17	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications.
18	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb) as well as when used as specialty lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb).
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL).
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD).
21	Lead and cadmium in printing inks for the application of enamels on borosilicate glass.
22	Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fiber optic communications systems.
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames.
24	Lead in solders for the soldering to machined through-hole discoidal and planar array ceramic multilayer capacitors.
25	Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes.
26	Lead oxide in the glass envelope of Black Light Blue (BLB) lamps.
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers.

Identity	IPC Attribute
28	Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection and Electromagnetic Interference Shielding in equipment falling under category three of Directive 2002/96/EC (IT and telecommunications equipment). Exemption granted until 1 July 2007.
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (*).

B2 **Exemption V2**

Unique ID Authority == IPC
Unique ID == EL2006/690/EC

Identity	IPC Attribute
1	Mercury in compact fluorescent lamps not exceeding 5 mg per lamp
2a	Mercury in straight fluorescent lamps for general purposes not exceeding 10 mg in halophosphate lamps.
2b	Mercury in straight fluorescent lamps for general purposes not exceeding 5 mg in triphosphate lamps with a normal lifetime.
2c	Mercury in straight fluorescent lamps for general purposes not exceeding 8 mg in triphosphate lamps with long lifetime.
3	Mercury in straight fluorescent lamps for special purposes
4	Mercury in other lamps not specifically mentioned in this Annex
5	Lead in glass of cathode ray tubes, electronic components and fluorescent tubes
6a	Lead as an alloying element in steel containing up to 0.35 % lead by weight
6b	Lead as an alloying element in aluminum containing up to 0.4 % lead by weight
6c	Lead as an alloying element in copper containing up to 4 % lead by weight
7a	Lead in high melting temperature type solders (i.e. lead based solder alloys containing 85 % by weight or more lead)
7b	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications
7c	Lead in electronic ceramic parts (e.g. piezoelectronic devices)
8	Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations
9	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators.
9a	DecaBDE in polymeric applications
9b	Lead in lead-bronze bearing shells and bushes
11	Lead used in compliant pin connector systems
12	Lead as a coating material for a thermal conduction module c-ring.
13a	Lead in optical and filter glass
13b	Cadmium in optical and filter glass
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
16	Lead in linear incandescent lamps with silicate coated tubes.
17	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications.
18	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($BaSi_2O_5:Pb$) as well as when used as specialty lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ($(Sr,Ba)_2MgSi_2O_7:Pb$).
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL).
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD).
21	Lead and cadmium in printing inks for the application of enamels on borosilicate glass.

Identity	IPC Attribute
22	Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fiber optic communications systems.
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames.
24	Lead in solders for the soldering to machined through-hole discoidal and planar array ceramic multilayer capacitors.
25	Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes.
26	Lead oxide in the glass envelope of Black Light Blue (BLB) lamps.
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers.
28	Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection and Electromagnetic Interference Shielding in equipment falling under category three of Directive 2002/96/EC (IT and telecommunications equipment). Exemption granted until 1 July 2007.
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (*).

B1 **Exemption V1**

Unique ID Authority == IPC
Unique ID == ExemptionlistV1

Identity	IPC Attribute
1	Mercury in compact fluorescent lamps not exceeding 5 mg per lamp
2a	Mercury in straight fluorescent lamps for general purposes not exceeding 10 mg. in halophosphate lamps
2b	Mercury in straight fluorescent lamps for general purposes not exceeding 5 mg. in triphosphate lamps with a normal lifetime
2c	Mercury in straight fluorescent lamps for general purposes not exceeding 8 mg triphosphate lamps with long lifetime.
3	Mercury in straight fluorescent lamps for special purposes
4	Mercury in other lamps not specifically mentioned in this list
5	Lead in glass of cathode ray tubes, electronic components and fluorescent tubes
6a	Lead as an alloying element in steel containing up to 0.35% lead by weight
6b	Lead as an alloying element in aluminum containing up to 0.4% lead by weight
6c	Lead as an alloying element in copper containing up to 4% lead by weight
7a	Lead in high melting temperature type solders (i.e. lead based solder alloys containing 85% by weight or more lead)
7b	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications
7c	Lead in electronic ceramic items (e.g. piezoelectronic devices)
8	Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations
9	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
10a	Deca BDE in polymeric applications
10b	Lead in lead/bronze bearing shells and bushes
11	Lead used in compliant pin connector systems
12	Lead as a coating material for a thermal conduction module c-ring
13a	Lead in optical and filter glass
13b	Cadmium in optical and filter glass
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages

Appendix C

JIG-101 Material Composition Declaration for Electronic Products List

NOTE: For Class C and Class D reporting, the latest Joint Industry Guide list of substances will be provided. This will be periodically updated as changes are made to this standard. As per the JIG-101 Edition 2.0 in Section 4:

"This Guide establishes three criteria that determine whether substances shall be declared. The resulting declarable substance list is based on these criteria which the industry has determined justify disclosure when these material/substances are present in electrotechnical products in amounts that exceed their specified threshold levels.

Criteria 1 – R (Regulated)

Substances that are subject to enacted legislation that (a) prohibits their use; or (b) restricts their use; or (c) requires reporting or results in other regulatory effects (e.g. labeling) and where the substance-specific effective date is currently in effect or scheduled to go into effect within the next 24 months.

Criteria 2 – A (For Assessment Only)

Substances that are likely to be subject to enacted legislation where the substance-specific effective dates of the regulatory requirements are uncertain.

Criteria 3 – I (For Information Only)

Substances that are not regulated but where there is a recognized market requirement for reporting their content in electrotechnical products. Reporting is used to facilitate company assessment regarding widely adopted industry environmental agreements or standards.

The criteria are listed in their order of priority. Substances that might be covered by more than one of these criteria will enter the declarable substance list only once, referring to the criteria with the highest order of priority and its requirements. The requirement to declare a substance in Annex A does not necessarily indicate a ban or restriction of that substance."

Further information on the JIG-101 can be found at www.eia.org/jig.

Please note that while the JIG-101 uses 'ppm' (parts per million) to define its threshold limits, all ppm values have been converted to mass% for reporting within the 1752 standard.

C1 <EL2006/690/EC-07-2008-preliminary>

Unique ID Authority == IPC
Unique ID == <EL2006/690/EC-07-2008-preliminary>

JIG-101 Ed 2 substance category name	JIG-101 Ed 2 Threshold	JIG-101 Ed 2 Rationale level	Revision Date
Asbestos	Intentionally added	R	4/28/2009
Azocolourants and azodyes which form certain aromatic amines	0.003 % by weight (300 ppm) of the finished textile/leather article	R	4/28/2009
Beryllium oxide	0.1 % by weight (1000 ppm) of the product	I	4/28/2009
Brominated Flame Retardants (other than PBBs, PBDEs or HBCDD)	0.1 % by weight (1000 ppm) of the product	I	4/28/2009
Cadmium/Cadmium Compounds-all except batteries **	0.01 % by weight (100 ppm) of homogeneous materials	R	4/28/2009
Cadmium/Cadmium Compounds- batteries **	0.0005 % by weight (5 ppm) of battery	R	4/28/2009
Chromium VI	0.1 % by weight (1,000 ppm) of homogeneous materials	R	4/28/2009
Diarsenic Pentoxide	0.1 % by weight (1,000 ppm) of the product	R	4/28/2009
Diarsenic Trioxide	0.1 % by weight (1,000 ppm) of the product	R	4/28/2009
Fluorinated greenhouse gases (HFC,PFC,SF6)	Intentionally added	R	4/28/2009
Formaldehyde-general category of articles	Intentionally added	R	4/28/2009
Formaldehyde-in textiles	0.0075 % by weight (75 ppm) of textile product	R	4/28/2009
Hexabromocyclododecane (HBCDD) and all major diastereoisomers	0.1 % by weight (1,000 ppm) of the product	R	4/28/2009
Lead/Lead compounds-general category of articles	0.1 % by weight (1000 ppm) of homogeneous materials	R	4/28/2009
Lead/Lead compounds in children toys	0.03% by weight (300 ppm) of children's product	R	4/28/2009
Lead/Lead compounds in paint and surface coatings of toys	0.009 % by weight of surface coating	R	4/28/2009
Lead/Lead compounds in cables/cords with thermoset/thermoplastic coatings	0.03 % by weight (300 ppm) of surface coating	R	4/28/2009
Lead/lead compounds in batteries	0.004 % by weight (40 ppm) of battery	R	4/28/2009
Mercury/Mercury compounds-all	Intentionally added or 0.1 % (1000 ppm) of homogeneous material	R	4/28/2009
Mercury/Mercury compounds in batteries	0.0001% by weight (1 ppm) of battery	R	4/28/2009
Nickel	Intentionally added	R	4/28/2009
Ozone Depleting Substances	Intentionally added	R	4/28/2009
Perchlorates	0.0000006 % by weight (0.006 ppm) of the product	R	4/28/2009
Perfluorooctane sulfonate (PFOS)	Intentionally added	R	4/28/2009
Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	Intentionally added	R	4/28/2009
Phthalates(DEHP,DBP,BBP)-general category of articles	0.1 % by weight (1,000 ppm) of the product	R	4/28/2009
Phthalates (DINP,DIDP,DNOP) in child care articles	0.1 % by weight (1000 ppm) of plasticized material	R	4/28/2009
Polybrominated Biphenyls (PBBs)	0.1 % by weight (1000 ppm) in homogeneous material	R	4/28/2009
Polybrominated Diphenylethers (PBDEs)-all	0.1 % by weight (1000 ppm) in homogeneous material	R	4/28/2009

JIG-101 Ed 2 substance category name	JIG-101 Ed 2 Threshold	JIG-101 Ed 2 Rationale level	Revision Date
Deca-Bromodiphenylether (Deca-BDE) (PBDE)	Intentionally added	R	4/28/2009
Polychlorinated Biphenyls (PCBs) and specific substitutes	Intentionally added	R	4/28/2009
Polychlorinated Terphenyls (PCTs)	Intentionally added	R	4/28/2009
Polychlorinated Naphthalenes (more than 3 chlorine atoms)	Intentionally added	R	4/28/2009
Polyvinyl Chloride (PVC)	0.1 % by weight (1000 ppm) of product	I	4/28/2009
Radioactive Substances	Intentionally added	R	4/28/2009
Shortchain Chlorinated Paraffins (C10 – C13)	0.1 % by weight (1,000 ppm) of product	R	4/28/2009
Certain Tributyl Tin (TBT) and Triphenyl Tin (TPT) compounds	Intentionally added	R	4/28/2009
Tributyl Tin Oxide (TBTO)	Intentionally added or 0.1 % by weight (1,000 ppm) of the product	R	4/28/2009
Tris (2-chloroethyl) phosphate (TCEP)	0.1 % by weight (1,000 ppm) of the product	A	4/28/2009

Note: Supplier information provided based on this “JIG-101 REACH screening list” does not guarantee compliance with the REACH Regulation for Article 33 communication and Article 72 notification duty for articles. Please consult with legal counsel regarding compliance.

Appendix D

REACH Substance Categories List

D1 <EL2006/690/EC-07-2008-preliminary>

Unique ID Authority == IPC
Unique ID == <EL2006/690/EC-07-2008-preliminary>

Table D1-1 REACH SVHCs Published on 10/28/08 Included in the JIG Substance List

Substance Name
Dibutyl Phthalate (DBP)
Diarsenic Pentoxide (1)
Diarsenic Trioxide (1)
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β-HBCDD, Γ-HBCDD) (1)
Phthalates (1): BBP
Bis (2-ethyl(hexyl)phthalate) (DEHP)
Alkanes, C10-13, chloro (Shortchain Chlorinated Paraffins) (1)
Bis(tributyltin) oxide (TBTO) (1)

Table D1-2 REACH SVHCs Published on 10/28/08 Not Included in the JIG Substance List

Substance Name
Anthracene
4,4'- Diaminodiphenylmethane
Cobalt dichloride
Sodium Dichromate
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)
Lead hydrogen arsenate
Triethyl arsenate

Appendix E

UML Model Characteristics for Materials Declarations Standard

The following illustration is an example of an analytical model that includes material declaration concepts intended to represent any of the IPC-175x family of standards. It consists of various elements and attributes necessary for trading partner information exchange.

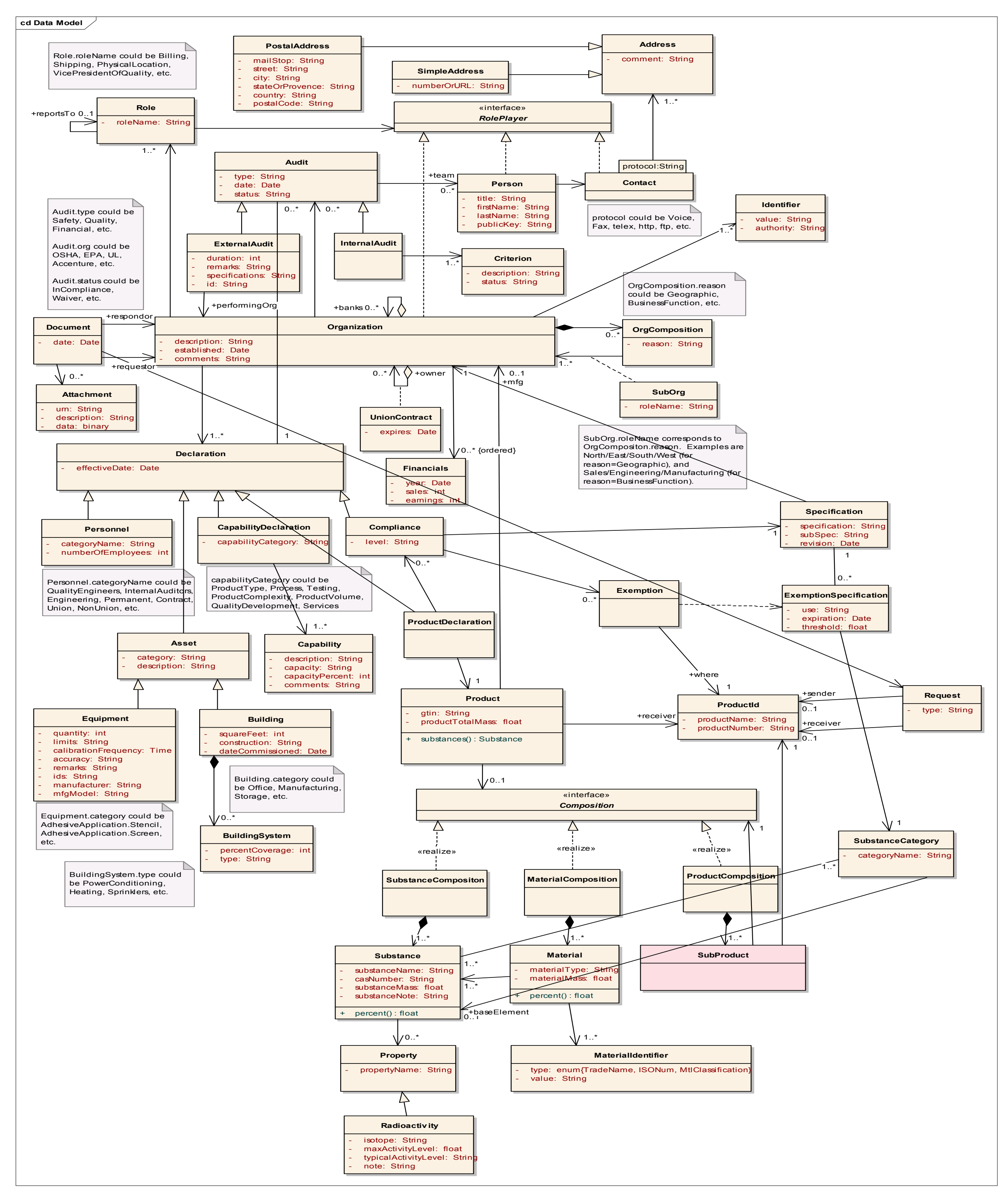


Figure E-1 UML Model Characteristics for Materials Declarations Standard

Appendix F

Verification Guidance

Verification involves ensuring that the information provided is accurate. Verification of declared materials information has a number of different aspects, described below. The following sections are specific to materials declaration.

F1 Validation

As the first step in verification, validation involves checking that the data provided are of the correct type. Requesters are encouraged to systematically validate data where possible to reduce the required verification effort. A file may be validated by comparing it against the 175x XML schema file. Data type accuracy can be improved by using drop-down menus, click-boxes, radio buttons and logic that ensures that names are alpha-numeric characters, weights are numeric, etc.

Requesters may ask suppliers to include analytical data or other documentation to confirm the data provided in the material declaration. The request for confirmatory documentation may be listed through a hyperlink to a web page or with the request as an attachment. Suppliers may also wish to submit confirmatory documentation even if this is not requested.

F2 Analytical Data

Though outside the scope of a material declaration, a requester may ask that a supplier provide analytical data. It may consist of non-destructive testing such as x-ray fluorescence (XRF) and/or destructive test methods such as inductive coupled plasma (ICP). This data may be added to a 175x data file. See IPC-1751 for details.

F3 Other Documentation

Other types of documentation which may be provided for confirmation include results from third party audits, test results verifying manufacturing process information, specification sheets or other documentation on recommended product alternatives or external confirmations/standards such as ISO, etc. This information may also be added to the XML file and is described in IPC-1751.

F4 Sampling

An additional level of verification is to actually sample and analyze the product as provided by the supplier, and compare the analytical results with those reported in the material declaration.

Once the product has been assembled and sent to the requester, it can be challenging to collect a sample of the homogeneous materials for analysis. Where a sample of the homogeneous material can be obtained by scraping it from the product or breaking the product open by destructive means, it is recommended that care be taken to avoid contamination of the sample and to ensure that only the homogeneous material is collected for analysis.

Verification of the material declaration at the product level by grinding and analysis is more easily accomplished, although this only provides analysis at the product level. Requesters are advised that such analysis may mask EU RoHS substances, since they may be present above regulated limits at the homogeneous material level and still not be detected at the product level. Analysis of the product therefore should not be used to verify material declaration at the homogeneous material level. However, this type of analysis is valid for verification of material declaration at the product level.

F5 Audit

A requester may request that a supplier participate in an audit to ensure that systems are in place to properly identify the materials used in their products and to properly report material declarations.

F6 Maintenance

IPC-1752 is a material declaration standard made to accommodate the needs of changing legislation, requirements, and technologies. Therefore, to keep IPC-1752 user friendly, periodic maintenance **shall** be done to serve the industry. IPC will periodically review IPC-1752 and make updates for the following reasons:

- Changing of exemptions in worldwide legislation
- Introduction of new worldwide material declaration related legislation
- The need to stay consistent with other changing standards (IPC-1751, JIG-101x, Rosetta Net 2A13, IEC 60194, etc.)
- Improvements of system interfaces

IPC will update IPC-1752 as needs arise. If you find that an improvement could be made to IPC-1752, to help serve the industry, please describe it in detail and email it to answers@ipc.org identifying the document number in the subject line.

Appendix G

Previous Versions of IPC-175X

Versions 1.0 and 1.1:

IPC-1751 *Generic Requirements for Declaration Process Management*

IPC-1752 *Sectional Requirements for Material Declaration Management*

IPC-1752-1 *Material and Substance Declaration Description Form – Class 1, 2, 3, and 4*

IPC-1752-2 *Material and Substance Declaration Description Form – Class 1, 2, 5 and 6*

IPC-1752-3 *Material and Substance Declaration Description Users Guide*

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Standard Improvement Form

IPC-1752A

The purpose of this form is to provide the Technical Committee of IPC with input from the industry regarding usage of the subject standard.

Individuals or companies are invited to submit comments to IPC. All comments will be collected and dispersed to the appropriate committee(s).

If you can provide input, please complete this form and return to:

IPC
3000 Lakeside Drive, Suite 309S
Bannockburn, IL 60015-1249
Fax 847 615.7105
E-mail: answers@ipc.org

1. I recommend changes to the following:

___ Requirement, paragraph number __________

___ Test Method number __________, paragraph number __________

The referenced paragraph number has proven to be:

___ Unclear ___ Too Rigid ___ In Error

___ Other ______________________________

2. Recommendations for correction:

____

____

____

____

3. Other suggestions for document improvement:

____

____

____

____

Submitted by:

Name ______________________________ Telephone ______________

Company ______________________________ E-mail ______________

Address ______________________________

City/State/Zip ______________________________ Date ______________

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